

The effects of *Vitex trifolia*, *Strobilanthes crispus* and *Aloe vera* herbal-mixed dietary supplementation on growth performance and disease resistance in red hybrid tilapia (*Oreochromis* sp.)

ABSTRACT

Herbs and herb mixtures have been used as a growth promotant in livestock and aquaculture production. The objective of the study was to evaluate the effect of a dietary herbal mix comprised of *Vitex trifolia* (VTE), *Strobilanthes crispus* (SCE) and *Aloe vera* (AVE) on the growth performance, disease resistance and histology of *Oreochromis* sp. for 60 days. The fishes were divided into i) control, infected fish, fed with normal diet and infected fishes treated with different herbal-mixed supplementation diets of ii) VTE and SCE iii) SCE and AVE iv) AVE and VTE. All experimental groups were challenged using with *Streptococcus agalactiae* (1×10^7 cfu/mL) via intraperitoneal route on day 46. On day 46th (pre-challenge) and 60th (post-challenge), five fish were randomly chosen from each tank for each experimental and control groups to blood collection. The cumulative mortality and survival rate were assessed every day. Tissues from kidney, liver and spleen were examined. The fish supplemented with herbal-mix with the combination of VTE and SCE and AVE and VTE showed improved growth performance. For haematological assays, RBC, Hb, and WBC were higher ($P < 0.05$) in fish supplemented with these herb mix, while the alanine aminotransferase (ALT) and alkaline phosphatase (ALP) were significantly affected by mixed-herbal supplementation. Histopathological examination of the organs revealed no negative effects in tissues. In conclusion, this study suggested that methanolic extracts of herbal mix composed of *V. trifolia*, *S. crispus* and *A. vera* extracts were effective as growth promoters and bacterial disease treatment in *Oreochromis* sp. when supplemented in daily diet.

Keyword: *Vitex trifolia*; *Strobilanthes crispus*; *Aloe vera*; Growth performance; Red tilapia; Bacterial resistance; Herbs